

Program: Building Construction Occupations

Course: Building Construction 1

Unit: Roof Framing

Lesson Title: Common Rafter Layout

Terminal Objective: Given a building section drawing, and a selection of tools and materials, the student will be able to lay out a common gable rafter to within $\pm 1/8$ " of specifications.

Enabling Objectives:

1. Identify parts of a roof structure
2. Identify layout terms and parts of a rafter
3. Calculate rafter length using three different methods

Associated Academic Standards

MATH

2.01.08 A

Represent and use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, exponents, scientific notation, square roots)

2.02.08 B

Add, subtract, multiply and divide different kinds and forms of rational numbers including integers, decimal fractions, percents and proper and improper fractions

2.03.08 D

Estimate, use and describe measures of distance, rate, perimeter, area, volume, weight, mass and angles

2.10.08 A

Compute measures of sides and angles using proportions, the Pythagorean Theorem and right triangle relationships

2.10.11 B

Identify, create and solve practical problems involving right triangles using the trigonometric functions and the Pythagorean Theorem

2.10.11 B

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Activities:

1. Discuss rafter parts
 - a. Handout 30: Plan view of rafters
 - b. Handout 31 (2 p.): Layout terms and parts
2. Reference: "Carpentry" by Koel
 - a. Discuss general gable roof layout. Unit 47, pages 343-344
 - b. Step-off method - p. 346; p. 348, figure 47-10
 - c. Rafter tables – p. 344; p. 345, figure 47-5 & 47-6
 - d. Lay out procedures – p. 347, figure 47-9
3. Construction Master IV calculator
 - a. Calculate length given total rise and run
 - b. Calculate length given run and slope
4. Practice procedures and calculations using building sizes and slopes generated by students

Evaluation: Student will be able to meet all listed performance criteria to within 1/8".

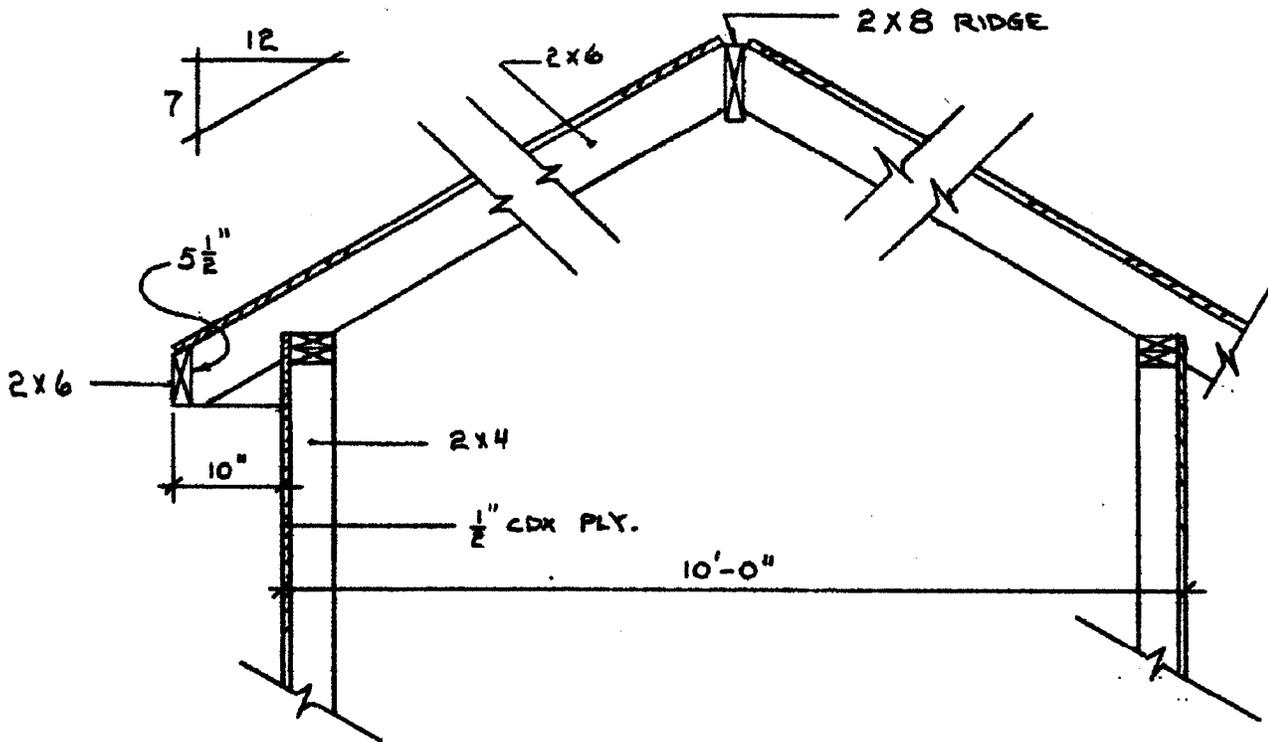
1. See gable roof rafter layout quiz 1

Tools & Materials:

1. "Carpentry" by Koel
2. Handouts 30 and 31 A and B
3. Construction Master IV calculator
4. Lengths of 2"x 6" SPF
5. 25' tape and stick rule
6. Framing square and rafter points

GABLE ROOF RAFTER LAYOUT QUIZ

1. Layout one 2"x 6" rafter to the specifications indicated in the drawing.
2. The seat cut will be the full width of the wall.
3. Mark all cut lines including ridge, tail, plancier, and bird's mouth.



RAFTER LAYOUT		
	ACCEPTABLE	PRACTICE NEEDED
General safety		
Use of tools		
Overall workmanship		
Rafter length		
Tail length		
Seat cut length		
Plancier cut		
Production / speed		